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UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte HYLKE AKKERMAN and HOWARD EDAN KATZ

Appeal 2009-013666
Application 10/701,183
Technology Center 2800

Before ERIC S. FRAHM, DAVID M. KOHUT, and
MICHAEL J. STRAUSS, *Administrative Patent Judges*.

FRAHM, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF CASE

Introduction

Appellants appeal under 35 U.S.C. § 134(a) from a final rejection of claims 1-3, 5-8, 10-13, 19, 21-24, 26, 28, and 30. Claims 4, 9, 14-18, 20, 25, and 27 have been canceled. We have jurisdiction under 35 U.S.C. § 6(b). We reverse.

Exemplary Claim

Exemplary independent claim 1 under appeal reads as follows (emphasis and some paragraphing added):

1. A semiconductor apparatus, comprising:

a dielectric layer comprising a surface, a portion of said surface having *exposed aromatic groups*, said dielectric layer being formed from a precursor composition including a member selected from the group consisting of: naphthalenes, styrenes, phenols, benzenes, and cresols; and

a polycrystalline semiconductor layer comprising an organic semiconductor composition overlying and in contact with said portion of said surface, said organic semiconductor composition comprising a compound comprising a chain-like moiety, the chain-like moiety comprising a conjugated thiophene or phenyl group and comprising alkyl chains at ends of the chain-like moiety.

Rejections

(1) The Examiner rejected claims 1-3, 7, 8, 10, 11, 13, 19, and 22-24 as being anticipated under 35 U.S.C. § 102(b) by Katz '397 (US 6,403,397 B1, Jun. 11, 2002). Ans. 3-6.

(2) The Examiner rejected claims 5, 6, 12, 13, 21, and 28-30 as being unpatentable under 35 U.S.C. § 103(a) over Katz '397, Hagen Klauk et al., *High-Mobility polymer gate dielectric pentacene thin film transistors*, JOURNAL OF APPLIED PHYSICS, VOL. 92, NO. 9, pp. 5259 and 6262 (Nov. 1,

2002) (hereinafter, "Klauk"), and Melissa Mushrush et al., *Easily Processable Phenylene – Thiophene-Based Organic Field-Effect Transistors and Solution-Fabricated Nonvolatile Transistor Memory Elements*, J. AM. CHEM. SOC., VOL. 125, pp. 9414-9423 (2003) (hereinafter, "Mushrush"). Ans. 6-10.

(3) The Examiner rejected claim 26 as being unpatentable under 35 U.S.C. § 103(a) over Katz '397 and Howard E. Katz et al., *Synthesis, Solubility, and Field-Effect Mobility of Elongated and Oxa-Substituted α,ω-Dialkyl Thiophene Oligomers, Externsion of "Polar Intermediate" Synthetic Strategy and Solution Deposition on Transistor Substrates*, CHEM. MATER, VOL. 10, pp. 633-638 (1998) (hereinafter, "Katz"). Ans. 6-10.

Appellants' Contentions

Appellants contend, *inter alia*, that the Examiner erred in rejecting (i) claims 1-3, 7, 8, 10, 11, 13, 19, and 22-24 as being anticipated by Katz '397 (App. Br. 8-14; Reply Br. 2-4); (ii) claims 5, 6, 12, 13, 21, and 28-30 as obvious over the combination of Katz '397, Klauk, and Mushrush (App. Br. 15-29; Reply Br. 4-5); or (iii) claim 26 as obvious over the combination of Katz '397 and Katz (App. Br. 30), because Katz '397 fails to disclose the limitation of a portion of the surface of a dielectric layer having "exposed aromatic groups," as recited in claims 1, 19, and 28.

Principal Issue on Appeal[1]

[1] We recognize that Appellants' arguments present additional issues. App. Br. 7-30; Reply Br. 2-5. We do not reach these additional issues as this issue is dispositive of the appeal.

Did the Examiner err in finding that Katz '397 discloses "a dielectric layer comprising a surface, a portion of said surface having "exposed aromatic groups," as recited in each of independent claims 1, 19, and 28?

ANALYSIS

We agree with Appellants' contention that Katz '397 fails to disclose the limitation of a portion of the surface of a dielectric layer having "exposed aromatic groups," as recited in claims 1, 19, and 28 above. Katz '397 discloses a dielectric layer made from polyimides or poly(methacrylates) (col. 3, ll. 13-19). Appellants admit that polyimides can be aliphatic (i.e., non-aromatic) or aromatic. App. Br. 12; Reply Br. 3. Polyimides can also be semi-aromatic. However, we agree with Appellants (App. Br. 11-12 and 17-18) that the Examiner has not provided sufficient evidence to show that either the polyimides or the poly(methacrylates) used in the dielectric layer of Katz '397 are aromatic materials, or that the dielectric layer is necessarily or inherently aromatic. Additionally, we agree with Appellants (App. Br. 11-12 and 17; Reply Br. 4 citing Katz '397, Table bridging portions of columns 5-10) that the Examiner has not shown how Katz '397 discloses that the surface of the dielectric layer is aromatic. Lastly, we agree with Appellants (Reply Br. 3-5) that Katz '397 fails to disclose that the polyimides and poly(methacrylates) described at column 3, line 13-17 are aromatic. In view of the foregoing, Appellants have established that the Examiner erred in determining that Katz '397 discloses a dielectric layer comprising a portion of the surface of the dielectric layer having "exposed aromatic groups," as recited in claims 1, 19, and 28.

Appellants' arguments as to the claims which ultimately depend from independent claims 1, 19, and 28 are persuasive for similar reasons as their corresponding independent claims.

Accordingly, we cannot sustain the Examiner's § 102(b) rejection based on Katz '397 and § 103(a) rejections based on (i) Katz '397, Klauk, and Mushrush, and (ii) Katz '397 and Katz.

CONCLUSIONS

Katz '397 fails to anticipate a dielectric layer including a surface with a portion of the surface having exposed aromatic groups, as set forth in each of independent claims 1 and 19. Klauk, Mushrush, and Katz fail to cure the above-noted deficiencies with regard to Katz '397 as to claims 1, 19, and 28. Accordingly, Appellants have established that the Examiner erred in rejecting claims 1-3, 5-8, 10-13, 19, 21-24, 26, 28, and 30 as being unpatentable under 35 U.S.C. §§ 102(b) and 103(a).

DECISION[2]

The Examiner's rejections of claims 1-3, 5-8, 10-13, 19, 21-24, 26, 28, and 30 are reversed.

REVERSED

[2] We have decided the appeal before us. However, should there be further prosecution, we leave it to the Examiner to consider whether the use of an aromatic polyimide would have been obvious under 35 U.S.C. § 103 in view of Katz '397 and/or other prior art.

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